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GEOGRAPHICAL RECORD

NORTH AMERICA

Coal Mining Breaks all Records. The Geological Survey reports that the United States coal output for 1913 was 570,048,125 short tons, which is more than double the production of 1900 and more than eight times the production of 1880. The value of the coal mined in 1913 is given as $760,488,785. Twenty-three of the twenty-nine coal producing states show increased production and only six decreased production. The decrease in Colorado was due solely to labor troubles. Of the states showing increased yield twelve made record production and Pennsylvania broke records in both bituminous and anthracite output.

The International Exposition at San Francisco. President Charles C. Moore, of the Panama-Pacific International Exposition, announces that events have proved the wisdom of the official decision not to postpone the opening of the exposition. Assurances have been received from France, Italy, Turkey and Japan that they will participate as promised. The Netherlands have added $300,000 to their original appropriation. Italy is erecting its building. The Exposition will lose some of the promised exhibits from Europe, but by no means all of them. Both Germany and Great Britain will be represented by individual exhibitors or by associations. There is a large demand for space from the manufacturers of this country, of South America, and of the European nations not at war. Ninety-two per cent. of the work of preparation for the opening is completed and the formal opening will occur on Feb. 20 prox., as promised.

Deep Boring at Spur, Texas. In the northwest part of Texas, east of the Pecos, the formations are nearly horizontal. This structure persists over the entire plains from the north end of the Panhandle to a line joining San Angelo and Pecos on the south. The area extends 330 miles from north to south, 170 miles from east to west and covers a fifth of the area of the state. It is fortunate for our knowledge of the stratigraphy of this region that a deep boring has been made not far from the central part of the area. Some large land owners in search of water for the town of Spur carried out the enterprise. Unfortunately for them, water was not found and the hole was abandoned in November, 1913, at a depth of 4,489 feet. The strata explored by the boring consist of three well marked divisions. The upper 1,250 feet are red sands, clays, marls, beds of gypsum, anhydrite, and salt in different degrees of purity and intermixture. Three beds of pure salt, ten, five and nine feet in thickness, lie between 570 and 741 feet below the surface. The succeeding 2,850 feet consist of dolomite with strata of anhydrite, sandstone and shale. The lowest 389 feet consist of limestone and shale. (Condensed from *Bull. Univ. of Texas No. 363,* 1914.)

Lectures on the Climatology of the Eastern Hemisphere. The programme of the Department of Geology and Geography of Harvard University includes this year, for the first time, a course of about forty lectures on the climatology of the Eastern Hemisphere. This course, listed as ''Meteorology 5,'' is parallel with two other half-courses on the climatology of North America (''Meteorology 3'') and on the climatology of South America (''Meteorology 4''), respectively. The object of the new course, which is designed particularly for students of geography, botany and history, and for others who wish to gain a general view of the climatic factor in the physical environment of man in the Eastern Hemisphere, is to sketch in outline the controls and broader characteristics of the climates of that hemisphere with special reference to the relations of these climates to human life. The broader geographical features are discussed as a basis for the study of the climates. The larger controls of climate over population, habitability, history, crops, occupations, travel and transportation, and health are considered, rather than the minuter details of the local climates. During the present winter the influence of the weather upon military operations in Europe will receive special attention. With the addition of this new course to its list, Harvard is now able to offer its students instruction in the climatology of all parts of the world. These courses in climatology are given by Professor R. DeC. Ward.

Publications of the Weather Bureau. A change in certain of the publications of the Weather Bureau began on Jan. 1, 1914. The *Monthly Weather Review,* which, since July, 1909, has contained comparatively few papers of general interest, being chiefly a collection of climatic data, has now returned to something of the scope and character which it had before that time, and which gave it a well-recognized position among the meteorological journals of the world. It was, in fact, recognized as representing American meteorology, although the *American Meteorological Journal,* from 1884 to 1896 did a most valuable work along somewhat similar lines. No one in this country could be found so well equipped for the position of editor of the new *Monthly Weather Review* as Professor Cleveland Abbe, the mainstay of American meteorology for nearly fifty years. Professor Abbe brings to his task a rich store of meteorological and physical knowledge which long experience and diligent labor have given him.

Coincident with the change in the character of the *Monthly Weather Review* came the suspension of the *Bulletin of the Mt. Weather Observatory,* established in 1907, and since then devoted to the more technical meteorological papers. The new *Review* is arranged in six sections, dealing respectively with aerology, general meteorology, forecasts, rivers and floods, bibliography and weather of the month. It is safe to say that this publication, which will hereafter contain also such technical studies as have been appearing in the *Bulletin of the Mt. Weather Observatory,* will be indispensable to all workers in the science of the earth's atmosphere. R. DeC. Ward.

Variations in Rainfall in California. A study of the variations in rainfall in California, made by William Gardner Reed, of the University of California, and presented at the meeting of the Cordilleran Section of the Geological Society, April 11, 1913, was published in the *Monthly Weather Review* (Nov., 1913). The period covered is 1880-1910. The number of stations is about thirty; the object of the inquiry was to determine the relations of wet and dry periods and to ascertain whether a periodicity of wet and dry seasons exists. That the seasonal precipitation for stations in California varies widely has long been well known, and, in some instances, there is a correspondence of dry and wet seasons in different parts of the state. The author's general conclusions are: (1) the amount of rainfall in California varies within wide limits; (2) in a general way, the variation is similar in character but not in amount throughout the state; (3) variations more or less similar in character and amount are to be found in each of four districts for which data are available; (4) the period of oscillation of the seasonal amounts is longer south of lat. 35° N. than north of it; (5) the "wet" year, 1889-90, and the "dry" year, 1897-98, were nearly or quite state-wide; (6) careful analysis of the data, and a rigid treatment of the results, are necessary before safe conclusions can be drawn regarding oscillations in California rainfall. Mr. Reed's study is one of a type which should be carried out in each state. The more such details of rainfall are studied, the more we shall be in a position to correlate crops and rainfall, and the more effective and practical will become our climatological knowledge. R. DeC. Ward.

The Weather and the Corn Crop. Investigation of relations between weather and crops, especially such as help towards a forecast of the probable crop yield on the basis of weather conditions previously noted, will always have great economic, as well as purely scientific interest. Professor J. Warren Smith, of the U. S. Weather Bureau, stationed at Columbus, O., has studied "The Effect of Weather upon the Yield of Corn" (*Monthly Weather Review*, Feb., 1914), and finds that the controlling weather factor is rainfall. It is noteworthy that "the critical point of growth of corn during which favorable weather will cause a large crop, and unfavorable weather a short crop, is comparatively brief." July rainfall has much more effect upon the field of corn than that of any other month, and the rainfall from mid-July to mid-August is more critical than that for any other period of equal duration. The larger the rainfall for the ten days following the date of blossoming, the larger the yield, and if the rainfall is small during these ten days a high temperature has a very unfavorable effect. Careful study of weather conditions up to August 10 makes possible a close estimate of the probable yield of corn. Rainfalls of one-half inch or more are more important than falls of less amount.

R. DeC. Ward.

Forest Fires and Weather Forecasts. Forest fires are one of our most serious problems in connection with our national conservation policy. Forest fires depend very largely upon weather conditions. Therefore, forecasts of weather which is favorable for the occurrence and spreading of such fires should be of great value in enabling us more successfully to prevent and check them. Mr. E. A. Beals, District Forecaster of the Weather Bureau at Portland, Ore., has made a study of "The Value of Weather Forecasts in the Problem of Protecting Forests from Fire" (*Monthly Weather Review*, Feb., 1914). Our largest and most destructive forest fires occur with prevailing cyclonic winds over a large area, but as most of our standing timber is in mountainous districts, mountain and valley winds become important controls. The author has selected four great forest fires for special detailed study, in order to see whether the winds might not have been forecasted far enough in advance to have made possible a more effective fight against these disasters. Numerous weather maps illustrate the weather conditions preceding and accompanying these fires. Strong winds, just before, during, and a short time after the fire passes a given place, are among the most striking features. The weather maps show no conditions sufficient to cause extraordinary winds, and the conclusion is that the fires themselves produced them. The velocity of such winds cannot, however, be predicted by a forecaster, for that depends upon local conditions, the size of the fire, etc. The general conclusion is that much assistance may be gained by an intelligent use of the facilities offered by the Weather Bureau, "but where forests are situated near the sea, or in a mountainous country, there are so many local controls to wind movement that much will have to be left to the man on the ground." R. DeC. Ward.

Through Passenger and Freight Service on the Grand Trunk Pacific. Through service on this new transcontinental railroad began in the second week of September. Track-laying was completed in April last, but through service was delayed for several months in order to place the road-bed and bridges in first class condition. Prince Rupert, the Pacific terminus of the railroad, is now in direct rail connection with eastern Canada and the United States. A new avenue of commerce has been opened to Canadian agriculture and industry.

Geology of Bermuda. Mr. L. V. Pirsson, Professor of Physical Geology in the Sheffield Scientific School, Yale University, has a paper in the *American Journal of Science* (Vol. 38, September, 1914, pp. 189-206) on the geology of Bermuda as revealed by a deep boring recently sunk by the owners of the Princess Hotel who hoped thereby to secure additional supplies of fresh water. This hope, of course, failed to be realized and the bore hole was abandoned after it had been carried down to 1,413 ft., where it terminated in solid lava. The paper includes a diagram of the boring showing a geological section, from which it is seen that three zones of essentially different materials were penetrated. First were the soft, chalky Bermuda limestones; second a layer of soft oxidized volcanic matter, yellow to brown in color; and third, fine compact lavas, dark gray in color, which persist to the bottom of the boring. The limestone is soft above sea level, somewhat harder below it and extends to a depth of 380 feet. The zone of oxidized material ends about 600 feet below the surface. Professor Pirsson suggests that this oxidized material represents the product of land waste. If this theory is admitted, the conclusion follows that Bermuda was once an island composed of volcanic rocks rising above the level of the sea which has been entirely cut away by the erosive action of the waves. At the bottom of the boring and up to 700 feet, lie the original lava flows which built up the cone, unoxidized because the rocks had been protected by the sea from the work of the atmosphere.

''Bermuda Island has been thought to be situated upon the apex of a volcanic mountain mass, and Verrill has made some suggestions as to its size, slopes, and probable history, but until the present boring was undertaken, there have been no direct facts which would prove this. Other than the statements and suggestions of Verrill, so far as the writer is aware, there has been no attempt made to consider its form and size in this connection. It would seem of interest to do this to obtain some data for comparison with other volcanic masses of a similar nature and situation.''

A sketch map of the Bermuda volcanic mass is introduced. This indicates that, on the sea floor, the volcanic base on which the islands and the neighboring Argus and Challenger Banks stand, extends in a northeast and southwest direction some 90 miles as an elongate ridge whose greatest breadth may be some 25-30 miles. At the sea level it has been cut away to a platform which at the 100 fathom line has a length of about 32 miles and a width of 16 miles. Southwest of it are the Argus and Challenger Banks, rudely circular in shape, about 5-6 miles in diameter and the same distance from each other and four miles from the main platform. It seems clear that they represent subordinate volcanic cones that have also been cut away by action of the sea.

If it is assumed that the main platform represents the truncated top of a single volcanic peak and if the profile is continued upward by the dotted lines, which Professor Pirsson shows in Fig. 2, then this peak, he estimates, would have risen 11,500 feet above the present sea level or about 26,000 feet above its base on the sea floor. This compares with Hawaii, whose peak reaches a height of 30,000 feet above the ocean bottom, and Samoa, 25,000 feet. It is quite as probable, however, that this platform was cut through several coalescing volcanic cones and in this case the height would not have been so great. Dr. Vaughan says it appears safe to assign an Eocene or pre-Eocene age to the Bermudian volcanic activity. Professor Verrill, of Yale University, suggests that the volcano was completed or formed during the Triassic or at its close and correlates it with the igneous outflows which marked this period along the North American coast. Professor Pirsson comments that the volcano may date from Triassic time, ''but it should be observed that the diabases of the Triassic are a feature of the border of an entirely different earth-segment from the one on which the Bermuda volcano is situated, one which has had a very different geological history and that they made their appearance while the region was undergoing tectonic movements of which we have no knowledge in the Bermuda area.''

CENTRAL AMERICA AND WEST INDIES

Official Opening to Traffic of the Panama Canal. Commercial traffic between the Atlantic and Pacific Oceans through the Panama Canal was inaugurated on Saturday, Aug. 15, by the Government steamship *Ancon,* which made the trip from the Atlantic to the Pacific in approximately nine hours. The *Ancon* carried, as guests of the Secretary of War, about 200 persons. Eleven commercial vessels passed through the canal on the following day and also the Peruvian torpedo destroyer *Teniente Rodriguez,* the first war vessel to use the waterway.

ASIA

Padre Murillo Velarde's Map of the Philippine Islands, 1734. In an article published in Paris in the *Bulletin géographie descriptive and historique,* for 1897, Mr. Gabriel Marcel called attention to a rare and important map of the Philippine Islands, compiled in 1734 by Padre Murillo Velarde. Only two copies preserved in the Bibliothèque Nationale at Paris were known to Mr. Marcel. One of these only is perfect. Fortunately, there exists another complete and perfect copy in the Division of Maps and Charts of the Congressional Library at Washington.

The importance of Velarde's map is that it may be regarded as the most successful attempt of the time correctly to delineate the Philippine Islands. It was compiled from actual observations and the best data attainable. It was engraved at Manila by a native artist, as is shown by the following inscription found in the lower right-hand corner: "Le esculpio Nicolas de la Cruz Bagay Indio Tagalo in Man - la - ano 1734." Regarding this Filipino engraver, we find in a work entitled: "Noticias sobre la imprente y el grabado en Filipinas," published at Madrid in 1893, by Dr. Pardo de Tavera, that he was "a Tagal Indian, a printer and an author, who seems to have been the most expert engraver and topographer in Manila." De La Cruz also engraved in 1744 a reduced copy of Velarde's map of the Philippine Islands, a copy of which is also preserved in the Library of Congress.*

Mr. Marcel says that Padre Velarde was born at Villa de Laujar in 1696, entered the Society of Jesus in 1718, and soon left for the Philippines, where he was successively professor of theology and law at Manila, rector of Antipolo and inspector of missions at Mindanao. He was a very learned man, who devoted himself to the study of the Indian languages and was fond of historical and geographical studies, as is shown by his History of the Philippines, and an historical geography in ten volumes, published at Madrid from 1752 to 1762. With reference to the origin of the map, Padre Velarde informs us in the *Sentir,* which he wrote for the Chronicle of Juan de San Antonio: "In 1733, I was ordered by His Catholic Majesty, to compile the map of these islands, and I published it in 1734. In it, I marked as many of the villages, capes, bays, harbors, rocks, straits, rivers, forts, distances, as I could, considering the scale of the map and the difficulty of the undertaking."

The map is on two large sheets, measuring each 43 x 14 inches; the lateral bands, 43 x 9½ inches each. In the lower left-hand corner a cartouche gives a short account of the government of the Philippines, with statistics of 142 villages. To give an idea of the commercial and naval activity of the Philippines, Padre Velarde scattered over the waters numerous pictures of vessels of various sizes and types, the routes followed by the galleons being indicated by means of double lines. Numerous names of capes, bays and rocks, as well as the names and location of tribes, provinces and villages are given. In "Nueva Castilla o Luzon," three of the largest rivers are delineated in their entire course, the "Rio Tajo" flowing northward, the "Rio Grande" and "Rio Chiquito" flowing into Manila Bay. Among the various tribes located on the map are the "Ygrotes gentiles, Calingas gentiles, Negros gentiles in the island of Luzon." In Mindoro island, we have the "Manguiares gentiles." This early authentic geographical nomenclature is of interest, and makes Padre Velarde's work a document of much import in the historical geography of the Philippines.

The illustrations in the two lateral bands give characteristics views of the natives and their country. The band attached to the right margin contains, besides two pictures, a map of the island of Guam, entitled: "Ysla de Gvajan," showing Agaña, Asan, Pago, Merizo and other towns; a detailed plan of Manila, showing the old city walls with cannon, the quarters reserved for natives, and twenty-six reference numbers referring to important buildings and places, among them being old Fort Santiago, the Cathedral, destroyed by an earthquake in 1863, the "Sto. Domingo" Convent, etc.; a map of Samboagan, which is the earliest one known to have been drawn on so large a scale; and a well-executed plan of Cavite. Mr. Marcel characterizes Padre Velarde's map as "a contribution to the artistic history of the Tagals, one of the rarest productions of the Philippines, and a cartographical monument of great rarity, almost unique." O. Welti.

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*This admirable, reduced reproduction by De La Cruz of Padre Murillo Velarde's map (36 x 21 inches), in colors, is included in the Atlas van Homan, 1760, and is in the collections of the American Geographical Society.

AUSTRALASIA AND OCEANIA

German Men of Science Detained in Australia. Dr. A. Penck, professor of geography at Berlin; Dr. F. von Luschan, professor of anthropology in the same institution, and Dr. J. Walther, professor of geology and paleontology at Halle, accepted invitations to attend the Australian meeting of the British Association. The war broke out while the meeting was in progress and these gentlemen, as well as a number of other German men of science, were recently reported to be still in Australia. Dr. Penck, however, was reported, on Oct. 24, to have arrived in London.

POLAR

Antarctic

Antarctica and Some of Its Problems. The *Geographical Journal* (June, 1914, pp. 605-630) prints a most suggestive paper under this title by Prof. T. W. Edgeworth David, Professor of Geology, University of Sydney, from which the following data are taken:

The area of Antarctica has been estimated by Dr. W. S. Bruce at over 5,000,000 square miles. Its mean altitude, the greatest of any of the continents, has been roughly calculated at about 6,000 feet, including its ice cap. If this were removed the mean altitude would be reduced by perhaps 1,000 to 2,000 feet. The coast line, omitting minor indentations but including the seaward boundary of thick, fast ice, is not less than about 14,000 miles long. Only about 4,000 miles have been even approximately explored and only about 2,500 miles in moderate detail. Little is known of the actual boundary between land and sea-ice for about 11,500 miles. It is difficult to define this unknown boundary by oceanographical survey, unsupported by inland sledge parties, because old pack ice keeps ships so far from the true rock coast that it is often invisible from the ship. Mr. Wild, of Mawson's expedition, found that, in Queen Mary Land, the Watson Glacier projects over 120 miles into the sea. The Ross Barrier extends, at a maximum, about 400 miles seaward of the true rock coast at its apex.

Portions of the Antarctic coast that are moderately well known may be divided (1) into more or less high rock coasts, (2) coasts with occasional nunataks and (3) ice coasts. Of these three principal types of known coasts about 2,500 miles are rock coasts and about 1,000 miles are nunatak coasts. The third type of coast—land barrier ice where the ice forms a sea-cliff resting on a rock foundation, and shelf ice where the ice projects some distance from the shore seaward—is the most characteristic feature of the Antarctic coast. It is, of course, a false coast in relation to the true outline of the land and in some cases is hundreds of miles in advance of the true coast.

With regard to mountain ranges, Dr. W. S. Bruce has given an approximate forecast of the probable positions of the chief mountain ranges of Antarctica. Dr. Mawson adopts Bruce's view that the great rock-faulted ranges of South Victoria, with their absence of folding and Atlantic type of eruptive rocks, are coincident with the highland described by Charcot at Terre Loubet, Terre Fallières, Terre Charcot; by Arctowski near Bransfield Strait, Gerlache Channel, etc.; and by Nordenskiöld, Gunnar Andersson, etc., near Hope Bay, Snow Island, Seymour Island, etc. The last area has considerable development of Jurassic rocks, comprising variegated tuffs and richly fossiliferous plant horizons. The latter are associated with igneous rocks of a very marked Pacific type and the authorities mentioned, and others, agree in regarding this western extremity of the Antarctic Continent as a direct continuation of the South American Andes; and they consider its whole structure as distinctly of Pacific type.

There are grave difficulties in the way of connecting the Antarctic horst of Ross Sea with the Andean fold ranges of Antarctica. Geographically this is the greatest of unsolved Antarctic problems. The great question is, are these two ranges one and the same or does the horst continue in the direction of Vahsel Bay at the head of Weddell Sea, where the horst may have become so low that it loses itself in relatively small nunataks. If the horst follows the latter direction, Penck's view of a strait from Weddell Sea to Ross Sea, cutting Antarctica in two, will prove to be correct.

The journey of Amundsen to the South Pole has confirmed Bruce's views in regard to mountains stretching from King Edward VII Land to the Antarctic horst.

Professor David also deals with the inland ice, notes that Amundsen crossed the ice divide, 11,000 feet above sea level, and calls attention to the importance of the further tracing of this ice divide and subordinate divides so as to define the chief ice drainage basins. The greatest thickness of the ice yet measured is that of the Drygalski ice barrier tongue, about 2,000 feet; but perhaps the inland ice is thickest where it is dammed back against the western side of the Ross region horst, and there it may be 5,000 feet thick. Probably, wherever there is a continuous downward slope seaward of the rock surface on which the ice rests, the thickness of the inland ice does not exceed 2,000 feet; but where tectonic sags and *senkungsfelder* exist, so as to impound the ice, its thickness may be much greater.

The author discusses the Nansen, Ross and Kaiser Wilhelm II Barriers and the geology of the continent. He referred to the probability that the growth of the Antarctic barriers is due to glacial tongues pushing out over the seas and joined together by snowfall, thus uniting the isolated tongues into a coherent whole. Many interesting oceanographic problems await solution, submarine ridges and banks will in time be traced, many soundings and temperatures are needed in the neighborhood of great barriers and glacier tongues and also deep as well as surface current observations. Professor David's remarks on meteorology are here quoted entire:

''In meteorology there is a grand field for research. Dr. Bruce has pioneered the way in West Antarctica, and as the result of his South Orkney observatory, and the later observations established by the enterprise of the Argentine Government, Dr. R. C. Mossman has lately shown that it is possible to predict the rainfall for sub-tropical Chile by knowing the barometric pressure in the South Orkneys. A high barometer there means that the Weddell Sea is iced over. A severe season with much sea-ice in the Antarctic appears, therefore, to be causally connected with a high barometric pressure, and this high pressure drives the low-pressure rainy belts further north than usual, and this gives sub-tropical Chile a good rainfall. Mossman has further shown that there is a remarkable coincidence between the height of the water of the Paraná River and that of the barometer in the South Orkneys. Mawson's wireless and meteorological station at Macquarie Island, which has daily been transmitting the weather elements to Australia and New Zealand, has proved of such value for understanding weather conditions that the Commonwealth Government have decided for the present to maintain the station at their own expense.

''It is hoped that, in time, a causal connection will be traced between the condition of the ice near Ross Sea and the position of the rainy belts over Australia and New Zealand. With a more detailed knowledge of the oceanography, glaciology, and meteorology of Antarctica, the whole cycle of weather conditions, not only in the Southern Hemisphere, but even north of the equator, will become much clearer. When one thinks of the financial losses, sufferings to man and beast, even disastrous shipwrecks that may be averted by reason of this fuller knowledge, one cannot but feel that, apart from the gain of noble traditions and high sentiment, Antarctic exploration, with all its hazards and all its tragedies, is more than justified by its solid additions to the sum of human knowledge.''

ANTHROPOGEOGRAPHY

Wet Bulb Thermometer Readings and Tropical Colonization. Investigations have been made by Vincent, Lancaster, Tyler and others of the effects of different combinations of air temperature and relative humidity upon human comfort and health. The subject has also attracted the attention of psychologists, Professor E. B. Titchener, of Cornell University, having recently written upon "The Psychophysics of Climate." Professor J. W. Gregory also presents a paper on the wet-bulb thermometer and tropical colonization (*Journ. Scot. Met. Soc.,* Vol. XVI, No. 29). The view that the tropics are injurious to health is prevalent, but the explanations of the fact are generally unsatisfactory. While heat is regarded as one of the principal factors in tropical diseases, it is recognized that no locality with a dry climate has a temperature so high as to be injurious to health. The hottest districts are often the most healthful. The healthfulness of tropical localities does not depend upon diurnal or annual ranges of temperature, and moisture is not necessarily injurious. The latter is, indeed, beneficial for some constitutions, but heat and moisture combined may be harmful. Experiments appear to indicate that "the industrial development of any locality where the wet-bulb temperature exceeds 80° will be almost and, if it exceed 88°, quite impossible." But statistics supplied to the author of this paper by the London Meteorological Office show that such high wet-bulb temperatures do occur in well-populated localities. The author regrets that the distribution of such temperatures is not well known. During part of the time when Professor M. W. Harrington was Chief of the U. S. Weather Bureau, wet-bulb 8 A. M. readings were printed on the Washington daily weather maps. In his "Handbuch der Klimatologie," von Hann recommends the inclusion of these readings in regular climatological tables. The *Annual Summary of the Australian Monthly Weather Report* for 1910 contains monthly wet-bulb isotherms from 9 A. M. observations. R. DEC. WARD.

OBITUARY

ALFRED JOHN JUKES-BROWN. This well-known geologist, formerly connected with the Geological Survey of England, died on August 14 at the age of sixty-three years.

DR. H. J. JOHNSTON-LAVIS. Dr. Johnston-Lavis, Professor of Vulcanology in the Royal University of Naples, was killed in a motor accident at Bourges early in September. He was born in London in 1856. He first attracted wide attention by his studies of Vesuvius and the large, detailed map he made of the volcano and its more recent lava flows.